

Ser. No. 10/619,294, Prelim. Amd.

IN THE SPECIFICATION

Paragraph at page 2, line 10:

An example: at 30 Hz, the wavelength of sound is 36.6 feet and therefore the wave number is 0.17 ft^{-1} . At that frequency, a 12-inch woofer (approximating a theoretical pulsating hemisphere of radius 0.5 ft) produces sound proportional to 2 (i.e., proportional to $1/r$) and wind proportional to 23.5 (i.e., proportional to $1/r^2 k$) right next to the speaker (i.e., at a distance of 0.5 feet). The total air motion is 23.6, which is calculated as the square root of $[(2)^2 + (23.5)^2]$. The two particle velocity components are added "vectorially" this way due to the 90° phase difference, not because of the direction of particle speed is different for the sound and wind; as noted, all the particle motion is in the radial direction, in or ~~[[our]]~~ out from the center of the hemisphere.

Paragraph at page 4, line 22:

Therefore, my first preferred embodiment is a hollow *ring* of speakers set into a plane baffle (e.g., the side of a speaker cabinet), with no speakers in the interior (or, only auxiliary speakers such as tweeters, sub-rings, etc.). Through the calculations mentioned above, and through symmetry arguments, I decided that at low frequencies a circular hollow ring of close-set speakers would have a radiating efficiency nearly as good as the radiating efficiency of a close-set disk array (or single large speaker) of the same diameter, as long as the total displacement of air is the same. (The total displacement is figured like the displacement of an engine, sum of bore times stroke, i.e., total speaker cone area times axial cone displacement). That is, I expected that a hollow ~~[[a]]~~ ring of small speakers should radiate bass sound as well as a single large speaker with a diameter equal to the outer ring diameter, if that large speaker moved the same amount of air (to do this it would have a smaller stroke than any of the small speakers).

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Paragraph at page 5, line 23:

My second preferred embodiment is a partial, rather than a full, ring of speakers. This embodiment uses a surface, such a floor, as a second baffle and reduces the number of speakers needed. This embodiment is based on symmetry. In a full ring the winds from the various speaker collide, as discussed above, and therefore the air at the center point of the array should be still at the surface of the baffle: only the pressure should rise and fall with the sound-cycles. But the same is true on a radial line passing from the center point between any two speakers; there should be no motion ~~[[on]]~~ of the air across such a line along the surface. And this holds true above the baffle surface: there should be no motion of the air across a *plane* rising from the radial line perpendicular to the surface.

Paragraph at page 6, line 5:

As an example, if a sheet of paper is held above the surface of the central baffle, perpendicular to that surface and along a line bisecting the ring of speakers, then it should not be buffeted by the wind from the speakers (or by the sound either). The forces on the paper, from the speakers on either side, are balanced.

Paragraph at page 6, line 9:

Thus, the production of sound from a ring does not involve any motion across a bisecting plane like that of the paper sheet. Therefore, if the paper is replaced with something heavy, like a sheet of plywood, and the speakers on one side of plywood are disconnected, the remaining half ring should keep radiating efficiently at a low frequency, because the air motion at the sheet of plywood is unchanged and the plywood is heavy enough to resist the buffeting caused by the half-ring of speakers. The sound volume will be decreased in volume because the number of speakers is decreased, but the bass radiating efficiency is not.

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Paragraph at page 9, line 10:

As an example of the second embodiment, I built a semi-circular cabinet with a semi-circular array of twelve $6\frac{1}{2}$ inch speakers. The speaker cabinet had a thickness of four and $\frac{1}{4}$ inches and a diameter of $29\frac{1}{2}$ inches, with the speakers inscribed within a circle of $28\frac{1}{2}$ inches on the front panel, so that the diameter of the central area between the speakers was 15.5 inches and the central area was larger in diameter than the speaker diameter. The twelve speakers, each of four ohms' impedance, were wired in three parallel gangs each comprising four speakers in series, so that the total impedance was 5.3 ohms. A two-rack-unit thick power amplifier was built into the middle portion of the cabinet, with a hole to access the amplifier controls. This speaker combo had a full bass response. The floor served as a symmetry baffle, the combo being held in position by gravity on the bottom mounting surface.